Remarks/Arguments

The Rejection of Claim 1 under 35 U.S.C. §102(b)

The Examiner rejected Claim 1 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 3,521,429 (Leffler). Applicants respectfully traverse the rejection.

Anticipation requires that all of the elements of the claim be taught within the four corners of a single reference. Amended independent Claim 1 recites an inlet end that has a plurality of orifices. This claim amendment is fully supported by the specification and interjects no new matter. Applicants respectfully submit that Claim1 now recites allowable subject.

Claim 1

Leffler does not teach an inlet end with a plurality of orifices

Claim 1 recites: "an inlet end comprising a **plurality** of orifices." The inlet end of Leffler has a single opening (See Col. 1, lines 65-70; Figure 1 and 3). Inlet conduit 14 attached to end plate 13, directs exhaust flow from an internal combustion engine to the inlet end of muffler 10. (Col. 2, lines 63-72) through a single hole. Leffler does not teach or disclose anything other than a hollow tube with a single orifice in the inlet end. Placement of multiple orifices in the inlet end of the device recited in Claim 1 creates backpressure upstream of the inlet end of the noise reducing device. A single orifice in the inlet end, as taught by Leffler, would not be capable of creating the backpressure build-up that multiple smaller orifices can achieve. Multiple orifices also assist in reducing or preventing turbulent fluid jet streams that produce excessive noise. The same can not be said of the single orifice design of Leffler. Hence, Leffler fails to teach an inlet end with a plurality of orifices as recited in Claim 1.

Leffler does not teach an inlet end operatively arranged to maintain a backpressure upstream of the inlet end that is greater than 5 psig

The muffler in Leffler is designed to not increase backpressure, since such an increase in backpressure will reduce the efficiency and reduce power of the engine. The '429 patent references the importance of not increasing backpressure and emphasizes that point by disclosing

a diffusing pack material that is chosen for its properties that don't increase backpressure substantially. (See Col. 2, lines 33-35). Leffler also discusses coating the packing material with lubricant to further lower backpressure. (Col. 2, lines 56-60). In fact, Leffler indicates that increased backpressure is a sign of a malfunctioning muffler and it is suggested that the muffler be dismantled and the packing material removed if backpressure develops. (Col.3, lines 23-33). Therefore, any element that would cause an increase in backpressure in the Leffler muffler would lead to an outcome that is contrary to the intended purpose of Leffler and would render Leffler inoperable.

Please see page 27 of the September 2005 Final Report from the Florida Fish and Wildlife Conservation Commission (Florida Report) in the Appendix, which can be found at http://www.floridaconservation.org/boating/airboat/. The Florida Report states that mufflers with no flow restriction (direct passage from the inlet end to the outlet end) generate minimal backpressure, and **mufflers that have indirect passage from the inlet to the outlet generate backpressure in the range of 1.4 psi** with a variation between $\pm$0.2 psi. Clearly, this range of backpressures is **well below the backpressure range of 5 psi that the device recited in Claim 1 generates**. Leffler does not teach a device that generates backpressure above 5 psig, let alone a device with an inlet end that is operatively arranged to create such backpressure. Hence, Leffler fails to teach all the limitations recited in Claim 1.

For all the reasons noted above, Claim 1 is novel. Claims 2 and 3, dependent from Claim 1, enjoy the same distinction.

Rejection of Claims 2-19 under 35 U.S.C. §103(a)

The Examiner rejected Claims 2-19 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 3,521,429 (*Leffler*) in view of U.S. Patent No. 3,884,037 (*Barber*). Applicants respectfully traverse the rejection.

Claims 2-12

In accordance with *In re Vaeck*, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Applicants have shown *supra* that *Leffler* does not teach all the limitations of Claim 1, namely, **the plurality of orifices on the inlet end** or the operative arrangement of the inlet end orifices to maintain backpressure **greater than 5 psig**. Nor does *Leffler* suggest all the limitations of Claim 1. Also, *Barber* fails to teach, disclose, or suggest those elements missing from *Leffler*, i.e., **the plurality of orifices on the inlet end** or the operative arrangement of the inlet end orifices to maintain backpressure **greater than 5 psig**. Therefore, Claim 1 is patentable over the combination of *Leffler* and *Barber*. Claims 2-12, dependent from Claim 1, enjoy the same distinction over the combination of *Leffler* and *Barber*.

Claims 13-17

The combination of Leffler and Barber do not teach or suggest the plurality of orifices in the inlet end to create backpressure over 5 psig

In accordance with *In re Vaeck*, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The combination of *Leffler* and *Barber* fails to teach or suggest all the claim limitations of Claim 13, namely, **the plurality of orifices on the inlet end** or the operative arrangement of the inlet end orifices to maintain backpressure **greater than 5 psig**. Both Leffler and Barber have inlet ends with a single orifice. The placement of multiple orifices in the inlet end of the device recited in Claim 13 creates the backpressure upstream of the inlet end of the noise reducing device, and a single orifice would not be capable of creating that backpressure build-up, particularly backpressure greater than 5 psig. Multiple orifices also assist in reducing or preventing turbulent fluid jet streams that produce excessive noise. Leffler and Barber both use a single orifice in the inlet end and attempt to reduce or avoid backpressure, which **teaches away from** the introduction of multiple orifices in the inlet end to increase back pressure. Therefore, the combination of Leffler and Barber does not teach or suggest disposing multiple orifices at the inlet end as recited in Claim 13.

The combination of Leffler and Barber does not teach or suggest a device with a wire mesh that is layered perpendicular to the housing

Both Leffler and Barber fail to teach or suggest a diffusing material that is a wire mesh layer that is layered perpendicular to the housing. The porous packing material described and illustrated in Leffler is fibrous glass and steel wool materials that are alternately layered that are "tubular sleeves concentrically arranged about the longitudinal axis of the tube (housing)." (Col. 2, lines 8-20). Alternative arrangements can include laying sheets one upon the other or spiraled coincident with the axis of the tube. (Col. 2, lines 20-23). Nothing in Leffler teaches that the porous packing material is wire mesh that is layered perpendicular to the housing (tube), as recited in Claim 13.

The catalyst supporting material described in Barber is described and illustrated as wire mesh or various combinations of metal fibers in the form of filaments, wires, or the like, *may be disposed* ***randomly*** in woven, interlaced, **reticulate** or **wrapped forms**." (emphasis added; Col. 4, lines 57-60). Barber also describes the steel wool of knit mesh material as possibly being in a cylindrical, spiral, or concentric form. (Col. 4, lines 61-68). Overall, Barber stresses the importance of having the packing material in a generally **helical configuration that is shaped into an annulus**. The helical shape is important to provide increased turbulence, which is necessary to force emissions in contact with as much surface area of the catalyst supporting material as possible. (Col. 5, lines 15-20). The structural arrangement of the wire mesh and wire layers recited in Claim 13 assist the device in reducing turbulence. Reducing or eliminating turbulence, the result produced by the device recited in Claim 13 in the present application, would reduce the effectiveness, or possible render ineffective, the catalytic converter taught by Barber. Barber teaches away from implementing a element that reduces turbulence. Furthermore, despite the detailed discussion of the arrangement of the wire mesh in a helical shape, Barber does not teach that the wire mesh should be layered perpendicular to a housing. Therefore, that element is not taught by Barber.

Since both Leffler and Barber fail to teach wire mesh that is layered perpendicular to a housing, the combination of those references also fails to teach or suggest that element as well.

The combination of Leffler and Barber does not teach or suggest a wire screen layered perpendicularly to the housing and disposed within the pack material

Leffler suggests that confining screens could be used at the inlet and outlet ends to prevent loss of packing material into the exhaust system, **but never discloses the placement of wire screen layered perpendicular to the housing and disposed *within* the pack material**.

Barber also does not teach the placement of at least one wire screen layered perpendicularly to the housing and disposed ***within*** the pack material.

The placement of the wire screen ***within*** the pack material is not a design choice that would be obvious to an artisan skilled in the art, but is a structural improvement over devices taught in Leffler and Barber that is not taught or suggested by either of those references. Placement of at least one stiffening wire screen within the pack material can prevent pack material from migrating within the housing or from becoming deformed. The stiffening wire screen also ensures that pack material maintains contact with the outlet face of the inlet end to achieve optimal noise attenuation.

Given that neither Leffler nor Barber individually teach or suggest the limitation discussed above, the combination of Leffler and Barber does not teach a noise reducing device with at least one wire screen layered perpendicularly to the housing and **disposed *within*** the packing material.

For the reasons stated above the combination of Leffler and Barber fails to render the invention recited in Claim 13 as obvious and the noise reducing device defined in Claim 13 is patentable over Leffler in view of Barber. Claims 14-17, which are dependent upon Claim 13, are also patentable over Leffler in view of Barber due to that dependency.

Claims 18-19

The arguments above relating to combination of Leffler and Barber failing to teach or suggest the plurality of orifices in the inlet end apply equally to the patentably of Claim 18 and are not repeated for the sake of brevity.

Another element that is not taught or suggested by the combination of Leffler and Barber is the four layer mesh and screen pack that is recited in Claim 18.

Leffler and Barber both fail to show a diffusing material that has a first layer of wire mesh that is layered perpendicular to the housing and proximate the inlet end to obstruct the inlet end. The porous packing material described and illustrated in Leffler is fibrous glass and steel wool materials that are alternately layered that are "tubular sleeves concentrically arranged about the longitudinal axis of the tube (housing)." (Col. 2, lines 8-20). Alternative arrangements can include laying sheets one upon the other or spiraled coincident with the axis of the tube. (Col. 2, lines 20-23). However, nothing in Leffler teaches that the porous packing material has a first wire mesh layer that is placed perpendicular to the housing and arranged to obstruct the inlet end orifices, second wire screen layer (stiffener) aligned parallel and proximate the first layer, a third wire mesh layer parallel and proximate the second layer, followed by a fourth wire screen layer parallel with the third layer arranged to obstruct the outlet end orifice, as recited in Claim 18. By placing different layers inside the housing and perpendicular to the housing as well, Claim 18 is teaching a selection of layers process that is not explicitly or implicitly taught by Leffler. Neither can Leffler provide a packing material that has a striated pattern of material that is arranged perpendicular to the housing as taught in Claim 18. The layering arrangement recited in Claim 18 is distinctly different than using tubular sleeves that are concentrically arranged as shown in Leffler and the four layer arrangement in not taught by Leffler. Furthermore, the second layer, the stiffener, position between to layer of wire mesh pack material is certainly not taught or suggested by the combination of Leffler and Barber.

The catalyst supporting material described in Barber is described and illustrated as wire mesh or various combinations of metal fibers in the form of filaments, wires, or the like, *may be disposed* ***randomly*** in woven, interlaced, **reticulate** or **wrapped forms**." (emphasis added; Col. 4, lines 57-60). Barber also describes the steel wool of knit mesh material as possibly being in a cylindrical, spiral, or concentric form. (Col. 4, lines 61-68). Overall, Barber stresses the importance of having the packing material in a generally **helical configuration that is shaped into an annulus**. The helical shape is important to provide increased turbulence, which is

necessary to force emissions in contact with as much surface area of the catalyst supporting material. Reducing or eliminating turbulence, the result produced by the device claimed in the present application, would reduce the effectiveness, or possible render ineffective, the catalytic converter taught by Barber. Despite the detailed discussion of the arrangement of the wire mesh in a helical shape, Barber does not teach that the wire mesh should be layered in perpendicular to a housing in multiple layers as required by the device recited in Claim 18. Contrary to Barber, Claim 18 has packing material comprised of four distinct layers that are layered proximate each other where the layers are not annular shaped with a hollow core. Such a configuration is completely different than the single mass taught by Barber (see Col. 5). Therefore, that element is not taught by Barber fails to teach or suggest the wire mesh and screens arranged perpendicular to the housing.

The layering of the wire mesh layers is not taught or suggested by the combination of Leffler and Barber since neither of those references teach nor suggest such an arrangement. The placement of a wire screen (stiffener) at the second layer is certainly not taught or suggested by the combination of Leffler and Barber given that both fail to even imply that a stiffener can be inserted between the packing materials. Inserting a second layer that is a stiffener within the packing material can prevent migration or deformation of the pack material. That feature is neither taught nor suggested by the combination of Leffler and Barber. Admittedly, Leffler may suggest the introduction of a "confining screen" at the ends to prevent packing material loss, but Leffler has no suggestion or teaching that the packing material is reinforced against deformation by placement of a screen only at the ends. Screens at the ends are not structural the same as screen in the pack material, thus Leffler does not teach or suggest this wire screen arrangement.

Therefore, Claim 18 is patentable over Leffler in view of Barber since the combination of those references fail to teach or a suggest a noise reducing device with a plurality of orifices in the inlet end, and wire mesh and wire screen layers that are aligned perpendicular to the housing. Claim 19, dependent from Claim 18, enjoys the same distinction. Therefore, Claims 2-19 are patentable over *Leffler* in view of *Barber* and Applicants courteously request that the rejections be removed.

Conclusion

Applicants respectfully submit that all pending claims are now in condition for allowance, which action is courteously requested. The Examiner is invited and encouraged to contact the undersigned attorney of record if such contact will facilitate an efficient examination and allowance of the application.

Respectfully submitted,

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